Dental Items of Significance

MAY 1994 NO. 42

FEATURED IN THIS ISSUE--

- ProBond bonding agent (Caulk)
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- Snore Guard (DSDP)
- Lifecycle Handpiece Air Station (Midwest)
- 1040 Cascade Chair (A-DEC)
- Clean Air System (Dentech)
- Steri-Prep (D.E.C.K. Associates)

Plus, answers to questions most frequently asked of DIS

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Dental Items of Significance is the official newsletter of the United States Air Force Dental Investigation Service. It contains the results of short-term and long-term evaluations of dental materials and equipment. It also presents administrative information of general interest and answers to questions most frequently asked of the Dental Investigation Service staff from personnel in the field.

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DEPARTMENT OF THE AIR FORCE
ARMSTRONG LABORATORY (AFMC)
BROOKS AIR FORCE BASE, TEXAS

5 Apr 94

MEMORANDUM FOR BASE DENTAL SURGEONS, COMMANDERS AND DIRECTORS OF FEDERAL DENTAL SERVICES

FROM: AL/AOCD
2507 Kennedy Circle
Brooks AFB TX 78235-5117

SUBJECT: DIS Newsletter #42

1. As summer approaches, DIS prepares for the inevitable personnel changes we have all come to expect. We will bid a fond farewell to Lt Col John Hatfield, who has been our OIC of Facilities Design and Standards. John will begin the Advanced Clinical Dentistry Residency at Eglin in June. His very large shoes will be ably filled by Lt Col Jim Kane who has been responsible for equipment evaluation. Lt Col Danny Leonard will be arriving from Shaw AFB in June to take over the equipment evaluation function.

2. Our very successful experiment with joint service operations will begin to wind down as LCDR John Kuehne returns to Great Lakes Naval Station. Petty Officer Mike Freeman is expected to remain at DIS for the immediate future. The collaboration between DIS and the Naval Dental Research Institute (NDRI) has been extremely productive. While stationed at DIS, Commander Kuehne has made a tremendous contribution to the body of knowledge about dental handpiece function and reliability. It must be noted that the loss of the NDRI positions was due to requirements for staffing reductions in the naval research community as a whole, and was not a reflection on the overall success of this program.

3. The articles presented in each issue of *DIS* are designed to provide our readers with a quick summary of our findings on a wide range of materials, equipment, and techniques. Each item represents an abstract of a comprehensive report prepared by DIS staffers. If you wish to learn more about products or how evaluations were performed, you can request a copy of the full report by calling or writing DIS. Reports are identified by the project number listed with each newsletter item.

4. Please keep in touch and let us know how we're doing. Have a safe, fun summer.

SHANNON E. MILLS, Lt Col, USAF, DC
Chief, USAF Dental Investigation Service

DENTAL ITEMS OF SIGNIFICANCE

The USAF Dental Investigation Service

The USAF Dental Investigation Service (DIS) was established on 1 October 1976 by AFR 162-7 to provide investigative guidance and assistance for all US Air Force dental personnel. The DIS consists of clinical, laboratory, and consultative capabilities maintained as an integral part of the Armstrong Laboratory. It has been set up specifically to solve operational problems and to evaluate methods, techniques, procedures, equipment, and materials as identified by military dental activities and by the office of the Air Force Surgeon General. In addition, DIS supports military medical centers and dental training programs in providing technical assistance for investigations that contribute to the training programs.

Distribution Statement

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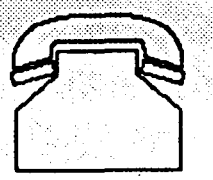

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ADMINISTRATION

42-01 Use of Radiometers to Evaluate Polymerization Light Units

A suggestion submitted by TSgt Dale Mattison serves as a reminder that it is important to check the intensity of the light provided by polymerization light units. This is extremely important because if light intensity from the polymerization unit is insufficient, light activated materials such as composite resins and glass ionomers will not completely polymerize. A reduction in light intensity can be due to deterioration of, or damage to, the bulb, reflector, filter, or light wand (guide). For example, blackening or frosting of the bulb can cause a reduction in light intensity of from 45% to 75%. One easy and effective way to check the adequacy of your light unit's output is to use a radiometer. Several companies manufacture relatively inexpensive (i.e., approximately $100 to $150) radiometers and at least one manufacturer markets a light unit with a built-in radiometer (LD Caulk's ProLite). Regardless of the specific radiometer used, it is a good idea to check the intensity of your light units frequently (i.e., monthly or even weekly).

(Lt Col Shaffer)

42-02 Prices Quoted in Dental Items of Significance

When the results of a product evaluation are printed in the Dental Items of Significance newsletter, one of the most important pieces of information provided is the item's cost. In the past, we have simply listed a price and often have not indicated whether it was a government or a retail price. Although the majority of our readers have assumed, correctly, that when a price is quoted without qualification it refers to a government price, we will list in future issues both the retail price and the government price for products. Naturally, there will be instances when these prices are the same because the manufacturer does not offer a government discount. In those cases we will still, however, list both prices. Although we make every effort to ensure that the prices we list are current and accurate, it is a good idea before you make a purchase to check with the supplier or manufacturer to confirm the price.

(Lt Col Charlton)

42-03 Resolving Product Complaints

If a dental product fails to perform up to the manufacturer's claims–or to your expectations–what recourse do you have?

If the product is federally stocklisted, your only hope for relief is based on the filing of a materiel complaint using the Standard Form (SF) 380. Your medical logistics section should be able to assist you in preparing the SF 380. Written guidance can be found in AFM 67-1, Vol V, Ch. 19. If the Defense Personnel Support Center (DPSC) does not have a "380" on file, then the problem simply **does not exist** no matter how loudly you complain.

If a defective product is not stocklisted by DPSC or you need additional assistance in resolving a

complaint, DIS may be able to help by directly contacting the manufacturer and discussing the problem. If you need this type of assistance, contact TSgt Maryse Springstead at DSN 240-3502.

(Lt Col Mills, TSgt Springstead)

42-04 Correction of Items in DIS 41

Items 41-34 "Lares 557 'Turbo+' High-Speed Handpiece" and 41-35 "Lares 757 'Workhorse' High-Speed Handpiece" erroneously reported that these handpieces use a lubricant that contains ozone-depleting chemicals. It has been brought to our attention that the lubricant does not contain these chemicals. We regret any inconvenience that this may have caused.

(Lt Col Charlton)

QUESTIONS & ANSWERS

"Questions & Answers" is a feature in the DIS newsletter in which we present and answer the questions we most frequently receive from the field. This month we feature questions about light activated glass ionomer restorative materials, precious metals recovery, and care of the dental unit light. Should you want more information about a particular topic, please contact the individual whose name follows the specific answer in which you are interested. If you have a question about a topic not discussed in this issue, please feel free to call DIS at DSN 240-3502.

42-05 Differences Between Visible Light Activated Glass Ionomer Restorative Materials

Question: My clinic is getting ready to purchase a light activated glass ionomer restorative material. How many are available now and what differences are there between them?

Answer: Currently there are four commercially available visible light activated glass ionomer products that are marketed primarily as restorative materials. As noted in DIS 42-19, these products are more accurately referred to as hybrid resin/glass ionomer restorative materials because their method of polymerization or hardening varies. Referring to them as light activated implies that this is their only means of hardening. Actually, some are light and chemically activated while one is only light activated. The four currently marketed products are Fuji II LC (GC America), VariGlass VLC (Caulk), Vitremer (3M), and Photac-Fil (ESPE).

Although these products are grouped together by many lecturers and clinicians, they differ from each other in several ways. One of the most obvious differences is their packaging configuration. Three of the products, Fuji II LC, VariGlass Pre-Cap, and Photac-Fil, are encapsulated. Vitremer is only available in a hand-mixed form and 3M has no plans to encapsulate it. The products also differ in the way dentin is treated prior to their placement. For Fuji II LC and Photac-Fil, dentin is treated with a polyacrylic acid solution, but for VariGlass and Vitremer the dentin is treated with a primer solution.

Recommendations concerning the need for post-placement protection of the glass ionomer with

a glaze also vary from product to product. While the manufacturers of Vitremer and Fuji II LC suggest that a bonding agent or varnish be placed on exposed surfaces to protect the material from moisture contamination and desiccation, the makers of VariGlass and Photac-Fil do not make this recommendation.

The hybrid resin/glass ionomer restorative products also differ in the number of shades available. Fuji II LC is available in eleven shades while Photac-Fil comes in eight shades. VariGlass and Vitremer are sold in six shades and one of these is blue for core build-ups.

When your clinic is making a decision about which of these products to purchase, spend some time reviewing the features and characteristics of the different products to ensure that you are buying the product that best suits your needs. If you would like additional information about these products and their uses, please call DIS.

(Lt Col Charlton)

42-06 Precious Metals Collection in the Dental Laboratory

Question: The Gold Finder vacuum cleaner that our lab uses for precious metals collection needs replacement. What do you recommend as a source?

Answer: There is a special DoD-wide program through which vacuum cleaners and filter bags are made available for collecting precious metal grindings and debris. The Precious Metals Recovery Program provides support to each installation through a network of area monitors. The monitor provides laboratories with portable, hand-held vacuum cleaners and filter bags, free of cost. Many facilities are still using the now obsolete Gold Finder unit which was originally issued over ten years ago. Supplies of replacement filter bags for the Gold Finder are scarce and often difficult to obtain. The current vacuum cleaner being provided is the Jelenko Scrap Master.

For the name of your area Precious Metals Monitor, contact your local Defense Reutilization Marketing Office (DRMO) personnel. If you require assistance, feel free to contact the program coordinator:

DRMS
Attn: DRMS-SM (Earl Douglas)
74 North Washington
Battle Creek, MI 49017-3092
Phone: DSN 932-7080; Comm (616) 961-7080
FAX: DSN 932-4759; Comm (616) 961-4759

(MSgt Thibadeau)

42-07 Use of Disposable Prophy Angles in the Midwest Handpiece

Question: When I try to use disposable prophy angles with my Midwest Shorty handpiece, the angles often split or fail to engage the shaft. What, if anything, am I doing wrong?

Answer: The problem is most likely with your equipment, not your technique. The Midwest "nose cone" type of straight handpiece, commonly found in Air Force clinics, is not designed for use with prophy angles. A doriot type attachment is required. The best (and least expensive) solution I have found is the Midwest U-Style Adaptor. This simple, short, doriot-type straight attachment is also compatible with the Rhino motor. The U-Style Adaptor catalog number is 760020 and is available on VA contract from Midwest Dental Products for about $30.00.

(Lt Col Mills)

42-08 Proper Care of the Dental Unit Light

Question: My dental unit light seems to have lost intensity over the years. What could be causing the problem?

Answer: One of the most common causes for reduced intensity of a dental unit light is application of disinfecting solutions to the reflector located immediately behind the bulb. Solutions such as these can damage the reflector and significantly reduce light intensity. This problem is a relatively common one because of the emphasis placed on infection control and the widespread use of disinfecting solutions. To keep the reflector clean without damaging it, I recommend the use of a mild soap and water solution. It is always a good idea to check the manufacturer's recommendations for proper care and maintenance of the light unit to avoid damaging it.

(DT1 Freeman)

GENERAL DENTISTRY

42-09 Imperva Bond Adhesive Bonding System (Project 93-73)

Imperva Bond is a bonding product that is purported to produce strong bonds to enamel and dentin. It consists of a standard 30% orthophosphoric acid etchant, dentin primer, and bonding agent. This project consisted of a laboratory evaluation of the product's one-week shear bond strength to moist and to dry human dentin and a clinical evaluation of its packaging configuration, dispensing system, and ease of placement.

Manufacturer:
Shofu Dental Corporation
4025 Bohannon Drive
Menlo Park, CA 94025
(800) 827-4638
(415) 324-0085
(415) 323-3180 FAX

Cost:
$71.97 Imperva Bond Kit (item no. PN 1230): 1 bottle of Enamel Etching Gel (6 mL); 1 bottle of Primer (5 mL); 1 bottle of Bonding Agent (5 mL); dish; sponges; 3 brushes

ADVANTAGES:
+ Forms strong bond to dentin; bond strength is comparable to that of other currently marketed dentin bonding agents.
+ Gives clinician the option of using an "all etch" technique or "enamel etch only" technique.
+ Less expensive than several other currently marketed bonding products (e.g., All-Bond 2: $127; Scotchbond MPA: $96; OptiBond: $82; Imperva Bond: $72).
+ Summary of product instructions is provided graphically on a laminated card.
+ Is easy to learn to use.
+ Kit contains a mixing well and a lightproof cover to prevent ambient light from polymerizing adhesive

resin.

DISADVANTAGES:
- Presence of visible moisture on dentin adversely affects bond strength.
- Primarily intended for use as an enamel and dentin bonding system; is not recommended for bonding to amalgam, porcelain, or noble and base metal alloys.
- Primer application is difficult using the small sponges provided in the kit.
- Product is not supplied with disposable brushes; this is a shortcoming in light of current infection control demands.

SUMMARY AND CONCLUSIONS:
Imperva Bond is a neatly packaged product used for bonding to enamel and dentin. Individual bottles are clearly labeled and the product is supplied with a mixing well and a lightproof cover to protect light-sensitive components. Concise instructions are provided in a booklet and are summarized on a laminated card. Clinicians found it somewhat difficult to apply the primer as directed by the manufacturer and found the product's range of clinical uses to be more limited than that of other dentin bonding products. To use Imperva Bond for "all purpose" bonding (i.e., bonding to porcelain, amalgam, base and noble metals), clinicians must purchase a companion resin cement, Imperva Dual. Imperva Bond's bond strength to dentin is comparable to that of other current generation dentin bonding products but is adversely affected by the presence of dentin moisture. **Imperva Bond is rated Acceptable for use by the federal dental services.**

(Lt Col Charlton)

42-10 ProBond All-Purpose Bonding Agent (Project 93-88)

ProBond is a bonding product that is purported to produce strong bonds to many different substrates (e.g., enamel, dentin, porcelain, amalgam, base and noble metal alloys) as well as to moist dentin. It is a two-component system consisting of a primer and adhesive and is intended to replace Caulk's popular dentin bonding product, Prisma Universal Bond 3. The product is provided with a booklet called "Quick Start" that contains a summary of instructions for its use. This project consisted of a laboratory evaluation of ProBond's one-week shear bond strength to moist and to dry human dentin and a clinical evaluation of its packaging configuration, dispensing system, and ease of placement.

Manufacturer:
Caulk/Dentsply
Lakeview and Clarke Avenues
P.O. Box 359
Milford, DE 19963-0359
(800) 532-2855
(302) 422-4511
(800) 788-4110 FAX

Cost:

$74.35 Standard Package (product no. 634275): 1 bottle of Primer (6 mL); 1 bottle of Adhesive (6 mL); 80 disposable brush tips; 1 transfer pad

$47.95 Refill Package (product no. 634255): 1 bottle Primer (6 mL)

$47.95 Refill Package (product no. 634245): 1 bottle Adhesive (6 mL)

ADVANTAGES:

+ Product is very easy to use for routine bonding because it consists of only two components and its application process is straightforward.
+ Components do not require mixing.
+ Requires less time for application than many other currently available dentin bonding products.
+ Summary of instructions for product use are provided in booklet form ("Quick Start").
+ Less expensive than several other currently marketed bonding products (e.g., All-Bond 2: $127; Scotchbond MPA: $96; OptiBond: $82; ProBond: $74).
+ Forms strong bond to dentin; bond strength is comparable to that of other currently marketed dentin bonding agents.
+ Forms a significantly stronger bond to visibly moist dentin than to dry dentin.

DISADVANTAGES:

- Although recommended by the manufacturer for bonding to porcelain, base and noble metal alloys, and amalgam, kit does not contain all necessary components for these bonding procedures (e.g., enamel etchant, silane solution, metal opaquer).
- Does not include disposable trays for dispensing primer and adhesive prior to application.
- "Quick Start" booklet is not as user-friendly as "flip-chart" cards provided with other products.
- Primer has a strong odor that clinicians and patients may find objectionable.

SUMMARY AND CONCLUSIONS:

ProBond is a two-component bonding product that clinicians found easy to use and relatively quick to apply. The product has a wide range of clinical applications and comes with a booklet of summarized instructions that is complete but not as user-friendly as the laminated, "flip-chart" card systems provided with other bonding products. ProBond's bond strength to dentin is comparable to that of other current generation dentin bonding products and it bonds significantly more strongly to visibly moist dentin than to dry dentin. It should be noted that "moist dentin" does not imply that ProBond should be applied to saliva-, blood-, or crevicular fluid-contaminated tooth structure. Adequate rubber dam isolation is still strongly recommended when using a bonding product such as ProBond. The product is less expensive than several other dentin bonding agents but is not an all-inclusive product. Not included in the kit are enamel etchant, silane solution, and metal opaquer. These items must be purchased separately if all bonding procedures described in the manufacturer's instructions are to be accomplished. The product is less time consuming to apply than many other bonding agents. **ProBond is rated Acceptable for use by the federal dental services.**

(Lt Col Charlton)

42-11 Indisperse Amalgam (Project 94-02)

Indisperse amalgam is a dispersed phase amalgam alloy that contains 5% indium. According to its manufacturer, the addition of indium increases strength, reduces creep, and reduces the amount of mercury released from the amalgam. The alloy is a blend of 50% lathe-cut particles and 50% copper-containing spherical particles and uses a mercury-to-alloy ratio of 0.85:1 (46%). The purpose of this project was to evaluate the clinical handling characteristics of the alloy in an attempt to compare its setting time, condensibility, and carvability with those of Dispersalloy (LD Caulk). Pertinent clinical trial results and published scientific literature were also reviewed as a means of determining its acceptability for use by the federal dental services.

Manufacturer:
Indisperse Distributing Company
23706 78th Place West
Edmonds, WA 98026
(800) 755-7720
(206) 367-1002
(206) 363-9983 FAX

Cost:
$68.00 100 capsules, 1.5 spill size, blue (each capsule containing 500 mg alloy, 445 mg mercury)

$288.00 500 capsules, 1.5 spill size, blue (each capsule containing 500 mg alloy, 445 mg mercury)

$80.00 100 capsules, 2.5 spill size, tan (each capsule containing 700 mg alloy, 600 mg mercury)

$340.00 500 capsules, 2.5 spill size, tan (each capsule containing 700 mg alloy, 600 mg mercury)

The alloy is available in slow, regular, and fast set forms. The setting times (as provided by the manufacturer) for the different forms are: slow set, 4 to 7 minutes; regular set, 3 to 5 minutes; and fast set, 2 to 2.5 minutes.

ADVANTAGES:
+ Studies by outside investigators indicate that Indisperse releases less mercury than nonindium-containing amalgams.
+ Physical properties (compressive strength, luster, surface roughness, corrosion, creep, and marginal deterioration) reported in the published scientific literature are at least comparable to those of other standard dispersed phase amalgam alloys.
+ Similar to other dispersed phase amalgams in its condensibility.
+ Is available in three setting rates: slow, regular, and fast.
+ Capsules are self-activating which eliminates the need for a separate activation device.
+ Capsule system worked well; mercury and alloy powder were consistently triturated and the capsules were easy to open.
+ Instructions provide recommended trituration frequencies as well as times.
+ Is ADA-certified.

DISADVANTAGES:
- Indisperse is not color-coded according to speed of set.
- Trituration instructions provided by the manufacturer do not include times for several common triturators (e.g., Automix, CapMix, Silamat Plus).
- Lower frequency triturators (i.e., those below 4500 cycles per minute) require trituration times as long as 15 seconds per mix.
- Because the alloy contains zinc, it may undergo excessive expansion if moisture-contaminated during placement.
- Is slightly drier than the popular dispersed phase amalgam, Dispersalloy.

SUMMARY AND CONCLUSIONS:
Clinical evaluators found that Indisperse was drier than Dispersalloy but had similar condensibility. In some cases, trituration times had to be altered to improve its consistency. Because only fast set Indisperse was evaluated in this project, handling characteristics may be different for the regular and slow set forms. Indisperse exhibits physical properties comparable to those of several other popular brands of amalgam and has performed well in outside clinical and laboratory studies. Certain indium-containing amalgams such as Indisperse have been found to release less mercury than

nonindium-containing brands. Indisperse's self-activating capsule system worked well and the capsules were easy to open after trituration. The product is comparable in cost to Dispersalloy. Indisperse amalgam is rated Acceptable for use by the federal dental services.

(Lt Col Charlton)

42-12 Photac-Fil Aplicap (Project 93-89)

Photac-Fil Aplicap is a light and chemically activated glass ionomer restorative material supplied in capsules. The capsules are activated with a hand-held metal activator and are mixed for 15 seconds at high speed in a standard triturator. The mixed material can then be expressed directly into the cavity preparation through the capsule nozzle using a metal applier. The product is supplied in eight shades, seven of which are indexed to the Vita shade guide. Photac-Fil is recommended by the manufacturer for use in class III and class V preparations, in minimal class I preparations, and as a core build-up and pit and fissure sealing material. This project evaluated Photac-Fil's radiopacity, in vitro shear bond strength to human dentin, and clinical handling characteristics.

Manufacturer:
ESPE-Premier Sales Corporation
1710 Romano Drive
P.O. Box 111
Norristown, PA 19404
(800) 344-8235
(215) 277-3800
(800) 458-3987 FAX

Cost:

$108.00 Photac-Fil Introductory Package: Fifty capsules (shades A1, A2, A3, A3.5, B2, B3, C4, DBO [dark-brown-opaque]), activator, applier, accessories (item no. 70820)

$75.00 Photac-Fil Refill Package: Fifty capsules, assorted shades (item no. 70822)

ADVANTAGES:

+ Is provided in capsules; encapsulated form ensures consistent powder-to-liquid ratio and makes mixing and clean-up easy.
+ Capsule system works well; consistently produces well-mixed material.
+ Capsule's curved nozzle facilitates direct placement of mixed material into preparations.
+ Capsules are individually packaged in a blister pack which promotes asepsis.
+ Capsule shade is clearly identified on blister pack.
+ Product shades are indexed to the Vita shade guide.
+ Is available in an adequate number of shades (eight) to accommodate most clinical cases.
+ Provides "command set" ability through exposure to visible light.
+ Manufacturer recommends a 20-second light exposure which is half as long as that recommended by manufacturers of several similar products.
+ Is dual activated which ensures a greater degree of polymerization if access to light wand is limited.
+ Has adequate working time under ambient lighting conditions.
+ Research by outside investigators indicates that Photac-Fil releases more fluoride in vitro than other hybrid resin/glass ionomer restorative materials.
+ Use of glaze to seal restoration is not recommended by manufacturer.

DISADVANTAGES:

- Because Photac-Fil is less radiopaque than enamel and dentin, it may be misinterpreted as caries on radiographs.
- Bond strength to dentin is much lower than values reported for other hybrid resin/glass ionomer restorative materials (e.g., Fuji II LC, Vitremer, and VariGlass VLC) evaluated by DIS.
- Once blister pack is opened, capsule has an effective shelf life of only one month.
- Although dentin pretreatment with polyacrylic acid is recommended prior to placing Photac-Fil, acid is not supplied with the product.
- Blister pack method of packaging is bulky and makes orderly arrangement of product difficult.
- Material must be light activated to harden completely.
- Little published research is available on hybrid resin/glass ionomer restorative materials.

SUMMARY AND CONCLUSIONS:

Photac-Fil is a light and chemically activated glass ionomer restorative material recommended by the manufacturer for use in class III and class V preparations, in minimal class I preparations, and as a core build-up and pit and fissure sealing material. The product does have a chemical component that contributes to its polymerization as indicated by the fact that it hardens to a degree when stored under dark conditions, however it must be light activated to completely harden. The product was well-received by clinicians who appreciated the consistency of mix achieved by the capsule system. They found the blister pack packaging bulky, however, and recommended that a conditioner solution be supplied in the kit. Photac-Fil's bond strength to dentin is very low and, in this regard, compares poorly to Fuji II LC, Vitremer, and VariGlass VLC. The material lacks sufficient radiopacity to ensure easy differentiation from enamel and dentin on radiograph. Because of the product's poor performance in laboratory bond strength and radiopacity testing, Photac-Fil is rated **Unacceptable** for use by the federal dental services.

(Lt Col Charlton)

42-13 Snore Guard (Project 93-16)

The Snore Guard is a prefabricated, orthotic appliance composed of a hard, stable acrylic resin and a softer, temperature-labile resin. The device is intended to diminish snoring by holding the mandible forward, thereby reducing the tendency of oropharyngeal soft tissue to block the airway as the patient relaxes. Snoring occurs when relaxation of oropharyngeal muscles allows soft tissue to partially obstruct the airway. The Snore Guard can be quickly customized for a patient in one office visit without the use of a laboratory. The device is simply placed in nearly boiling water for two to three minutes, tempered, and positioned in the patient's mouth in a manner similar to a maxillary impression tray. Once the material has been molded to the maxillary arch, it maintains its shape. The mandibular portion is then formed by softening and adjusting a ramp for the mandibular anterior teeth to rest against.

Source:

Dental Sleep Disorder Prevention, Inc.
P.O. Box 21623
Albuquerque, NM 87154
(800) 477-6673
(505) 299-9172
(505) 299-9164 FAX

Cost:

Retail: $422.00 Starter Kit (Includes instructional video tapes, patient and provider information

booklets, promotional and marketing literature, and four appliances). Price discounts are available if the product is purchased in volume:

1 to 5 appliances: $64.50 each
6-14 appliances: $54.50 each
More than 15: $49.00 each

Government: Starter Kit: $299.00; Individual Snore Guards (any quantity): $25.00 each

ADVANTAGES:

+ Prefabricated appliance requires minimal chair time to insert.
+ No laboratory steps are required.
+ Most patients reported nearly immediate reduction in snoring.
+ Many patients noted improved sleep patterns, resulting in less daytime fatigue.
+ Snore Guard was easy for patients to insert, remove, and maintain.

DISADVANTAGES:

- Snore Guard does not provide full occlusal coverage and may therefore result in unwanted tooth movement.
- Soft nature of the Snore Guard material may shorten its usable life expectancy; may need to be remade in about one year.
- May be inappropriate for periodontally involved teeth.
- Difficult to modify or adjust; easier to start over with a new appliance.
- Less retentive than laboratory-fabricated appliances.
- May be less comfortable for some patients than laboratory-fabricated appliances.

SUMMARY AND CONCLUSIONS:

The Snore Guard is a simple device, similar to a soft acrylic mouthguard, that can quickly and easily be provided to patients seeking treatment for snoring. In this project, the majority of patients fitted with a Snore Guard noted immediate reduction in snoring, although a few indicated that the improvement tapered off over time. Because the Snore Guard does not provide full occlusal coverage, which could allow unwanted tooth movement, patients should be followed very closely. If patients note improvement when using the device, they should be evaluated for fabrication of a custom, full-coverage appliance. Making such an appliance requires laboratory support and multiple clinic appointments but would have the benefit of providing occlusal stabilization and a more durable, long-lasting device. While the Snore Guard is easy to use, it may need to be remade annually. Use of the Snore Guard may be most appropriate for short-term assessment of patient response to therapy. The Snore Guard is rated **Acceptable** for use in federal dental facilities.

(Lt Col Plamondon)

42-14 1040 Cascade Chair (Project 93-06)

The 1040 Cascade Chair is an electronically-controlled, hydraulically-powered dental chair. The upholstery is contoured and seamless which makes rapid disinfection possible. It has floating armrests that automatically rise with the chair and lower back into the chair seat during exit. All chair functions are controlled by three switches on the Cascade footswitch. If the chair is purchased with the A-DEC Cascade Dental Delivery System, a keypad that also controls chair functions is attached to the control head. The chair was evaluated using a standard chair evaluation checklist and was used for patient treatment at an Air Force dental clinic for 90 days.

Manufacturer:
A-DEC, Inc.
2601 Crestview Drive
Newberg, OR 97132
(800) 547-1883
(503) 538-7478
(503) 538-0276 FAX

Cost:
$3,639.38

ADVANTAGES:
+ Vacuum-formed upholstery permits easy disinfection.
+ Smooth surfaces enhance ease of disinfection.
+ Upholstery comes in three sections for easy removal and replacement.
+ Chair is extremely stable in all positions.
+ Foot control operates all chair movements.
+ Is capable of three positioning programs.
+ Armrests allow easy and quick patient entry/exit.
+ Having the umbilical tubing in the chair rather than running along the floor allows easier cleaning and eliminates a trip hazard.
+ The key pad provides a backup set of controls if needed.
+ Key pad is easily barrier protected and/or disinfected.

DISADVANTAGES:
- Armrest does not facilitate intravenous procedures.
- Armrests do not support patient's arms.
- Use of the foot control is not intuitive; some time is required to learn how to properly use it.

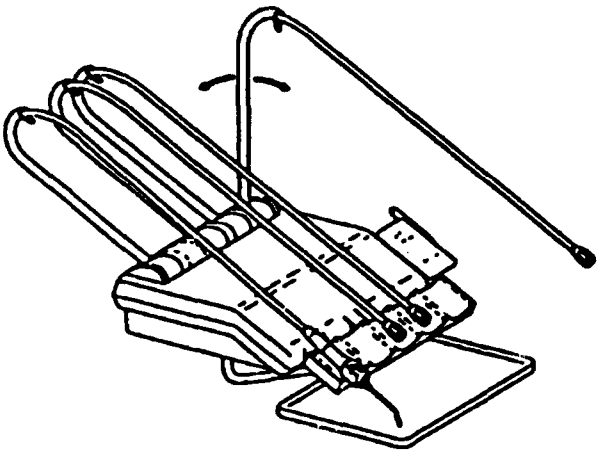
SUMMARY AND CONCLUSIONS:
The A-DEC 1040 Chair enhances infection control with its contoured, seamless upholstery which can be easily and quickly disinfected. The elimination of hand controls from the chair back also contributes to better infection control. Some clinical evaluators found the footswitch somewhat difficult to learn to use and were reluctant to use the chair because it lacked hand controls. Armrests were short and did not fully support patients' arms during use. The A-DEC 1040 Chair is Acceptable for use in federal dental facilities.

(TSgt Springstead, DT1 Freeman)

42-15 Cascade 2180 Continental-Style Unit (Project 93-40)

The Cascade delivery system is available in three different packages: 2180, 2181, and 2182. Each of these packages can be customized by selecting factory-installed accessories. The delivery system evaluated was the Cascade 2180 Continental-Style Unit for over-the-patient delivery. A technical evaluation was conducted at DIS using a standard checklist (reference MIL-D-42007A). The unit was evaluated for safety requirements, quality of material and workmanship, and basic operation. Upon completion of the technical evaluation, the unit was installed in a dental clinic for a 90-day user evaluation.

Manufacturer:
A-DEC, Inc.
2601 Crestview Drive
Newberg, OR 97132
(800) 547-1883
(503) 538-7478
(503) 538-0276 FAX



Cost:
Retail: $8,595.00
Government: $5,138.47
Note: quantity pricing is available

ADVANTAGES:
+ Handpieces rest on the handpiece pad which reduces the risk of percutaneous injury.
+ Handpiece hoses do not hang down on the patient.
+ Smooth surfaces allow easy and quick disinfection.
+ Cuspidor accessories and housing can be easily removed for cleaning.
+ Collection trap is easy to locate and clean.
+ Controls are available on unit for operation of the chair and light.

DISADVANTAGES:
- An excessive number of screws on control head makes removal of cover difficult.
- Can not see master on/off switch or indicator from front of control head.
- Some evaluators felt that access to certain areas of the oral cavity was more limited than with traditional delivery systems.

SUMMARY AND CONCLUSIONS:
The Cascade Unit met or exceeded most of the standard unit checklist. The manner in which the handpieces rested above the bracket table was a major advantage of this style of delivery system because with the bracket table positioned to one side or the other, it is less likely that a dentist will suffer a percutaneous injury. The entire unit was designed to enhance infection control by allowing easy cleaning of all components and surfaces. The addition of controls to operate the chair and the light from the unit promotes better infection control by allowing the users to keep their hands in one general area. The Cascade 2180 Continental-Style Unit is rated Acceptable for use in federal dental facilities.

(TSgt Springstead, DT1 Freeman)

42-16 A-DEC 6300 Dental Light (Project 93-41)

The manufacturer provided this light as part of a "system evaluation". The light had previously been evaluated by DIS (project 86-37, October 1986) and was rated as acceptable for use at that time. To accommodate and enhance the Cascade system, the light has had minor changes made to its construction. The changes are as listed and do not affect the quality of the light: the transformer can be located in the junction box, an air switch has been added which gives the operator the capability of turning the light on and off with the unit master on/off switch, and the metal surfaces are covered with a specially processed paint that is purported to be more durable than previous finishes. Location of the transformer and the added air switch are optional items which have been made available for the Cascade system.

Manufacturer:
A-DEC, Inc.
2601 Crestview Drive
Newberg, OR 97132
(800) 547-1883
(503) 538-7478
(503) 538-0276 FAX

Cost of standard light: $1,015.23

Cost with Cascade options: $1,056.79

The 6300 Light is available for over-the-patient, wall, or ceiling mounting. It has a three-position toggle that sets the light intensity for low, medium, or high. The on/off switch is located near the light head for easy access to the operator. In addition, the operator has the ability to turn the light on and off with the unit master on/off switch (Cascade system only).

ADVANTAGES:
+ Well-designed and well-constructed.
+ Bulb was easy to replace and extra bulb was provided.
+ Light head was stable when positioned.
+ Disinfecting procedures were easily accomplished.
+ The light was protected from overload by a fuse.
+ Easy to barrier protect.

DISADVANTAGES:
- Not interchangeable with lights from previous (non-Cascade) A-DEC units or with lights from other manufacturers.

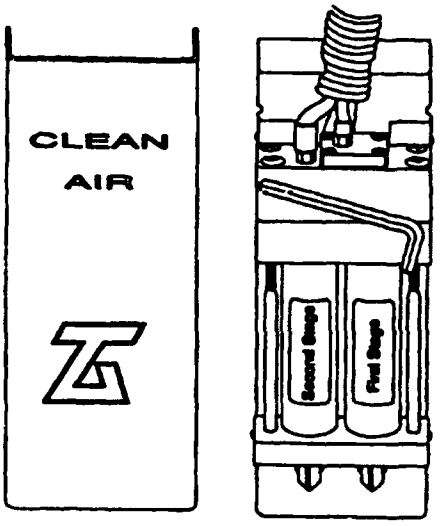
SUMMARY AND CONCLUSIONS:
The A-DEC light continues to meet required specifications and is easy and quick to disinfect. The added changes in construction were made available as an option for the Cascade system and have been well-received by clinicians. The A-DEC 6300 Light for the Cascade system is rated Acceptable for use by the federal dental services.

(TSgt Springstead, DT1 Freeman)

42-17 Clean Air System (Project 93-36S)

The Clean Air System is a two-stage air filtration system designed to remove harmful moisture and oil contaminants from the air supply. The unit contains two filters: one is metal weave and the other is cloth. The filters require replacement every 6 months. It can be either post-mounted or flush-mounted on the dental unit. The unit measures 8.5 inches high, 3.25 inches wide, and 2.5 inches deep. Installation is easily accomplished by connecting a Clean Air System to the main air line in each dental treatment room (DTR). Installation is completed by connecting the drain line to the evacuation system or drain. The diagram on the next page shows the inside of the Clean Air System after removal of its protective metal cover.

Manufacturer:
Dentech Corporation
P.O. Box 157
529 West Front Street
Sumas, WA 98925
(206) 988-7911
(206) 988-7906 FAX



Cost:
Retail: $545.00
Government: $249.75

Replacement Filter cost:
Metal weave: Retail $23.00; Government $9.80
Cloth weave: Retail $9.80; Government $9.80

ADVANTAGES:
+ May be an effective short-term solution to air line contamination
+ Easy to install.
+ May be a long-term solution for condensation in the air line.

DISADVANTAGES:
- Expensive to install because each DTR requires a unit.
- More expensive than correcting the source of the moisture or oil (e.g., faulty air dryer or compressor).
- The filters will only remove particles 5 microns or larger.

SUMMARY AND CONCLUSIONS:
The Clean Air System may be an effective short-term solution to air line contamination, however, the best solution is to correct the cause of the contamination, typically a compressor or air dryer malfunction. One exception to this is when the compressor is installed a great distance from the DTR. In this case condensation can form in the air lines. If there is more than one DTR, a unit will have to be installed in each treatment room. The cost for repairing the compressor or air dryer will probably be less than installing this system in each DTR. This product should be viewed as a short-term solution to air line contamination until the existing problem with the compressor or dryer can be corrected. According to AL-TR-1991-0165, "Dental Compressed Air Systems", the final filter on a dental compressed air system is typically 0.01 micron. Because the filtration ability of this unit (5 microns) compares poorly, it is not suitable for the removal of fine particles. The Clean Air System may be a suitable long-term solution if a compressor is installed a great distance from a DTR and condensation is forming in the air lines. The other alternative is to move the air dryer closer to the DTRs.

(DT1 Freeman)

42-18 Snoring and Sleep Apnea

This newsletter contains the results of an evaluation of the Snore Guard, a device that is marketed to reduce snoring. While snoring is frequently the subject of jokes and ridicule, it can be a very serious matter. Snoring may affect as many as 50% of adult males and 30% of adult females. As many as 16% of habitual snorers may have Obstructive Sleep Apnea Syndrome (OSAS), a morbid condition characterized by frequent cessation of breathing during sleep. The result is a complex of signs and symptoms related to frequent periods of hypoxia and sleep interruption. It may include complaints of

excessive daytime fatigue (somnolence), headaches, depression, anxiety, and poor job performance. It has been estimated that 80 million Americans may have some type of sleep disorder. A significant economic impact (possibly as high as $64 billion yearly) has been related to these patients due to poor job performance and fatigue-related accidents on the job. Between 200,000 and 400,000 motor vehicle accidents each year may also be the result of drowsiness.

Diagnosis of sleep disorders and OSAS is a medical diagnosis based on history, physical findings, and polysomnography (sleep laboratory studies). Because there are more potential causes than simply the position of the tongue and other oropharyngeal structures, only a physician should make the diagnosis of OSAS.

While the diagnosis of OSAS remains within the purview of the physician, treatment should at least consider the use of dental appliances delivered and maintained by a qualified dentist. Although snoring can be treated by the dentist alone, it is wise to consult a physician to rule out other contributing factors and to rule out OSAS.

Anyone who can make a bite splint can make a sleep apnea appliance. Many types of appliances have been described in the literature. Col Rod Knudson (Wilford Hall Medical Center, Lackland AFB TX) and Col Jack Meyer (William Beaumont Hospital, Fort Bliss TX) have written many articles about sleep apnea appliances and have tried several different designs. A technique for making an appliance is described in Attachment 1.

Treating sleep disorder patients can be very rewarding. In some cases, a relatively simple treatment can produce remarkable results. If you want more information on sleep disorders, refer to one of our military experts or call me for a list of articles on the subject.

(Lt Col Plamondon)

42-19 Synopsis of Visible Light Activated Glass Ionomer Restorative Materials (Project 94-05)

Glass ionomer cements have gained widespread acceptance since their introduction in the mid-1970s. In addition to the four established forms of glass ionomers, a new class, the visible light activated restorative materials, has been introduced. Although called "light activated", a more appropriate term for them may be "hybrid resin/glass ionomer restorative materials". This is because "light activated" seems to imply that exposure to a visible light unit is the only means by which they polymerize. In actuality, the products differ in this regard; Fuji II LC (GC America) and Photac-Fil (ESPE) polymerize as a result of chemical and light activation, VariGlass VLC (LD Caulk) is only light activated, and Vitremer (3M) polymerizes as a result of three different mechanisms.

The hybrid resin/glass ionomer restorative materials offer distinct advantages compared to the chemically set forms because they provide the clinician with "command set" and exhibit reduced sensitivity to desiccation. Although there are many similarities between the four currently available products, there are some definite differences. Among these differences are the packaging form (hand-mixed versus encapsulated), method of dentin pretreatment (primer versus polyacrylic acid), need for post-placement surface protection (glazing with a bonding resin versus no glazing), bond strength to dentin, and cost. DIS has evaluated all four hybrid resin/glass ionomer restorative products: VariGlass VLC in DIS 39-24, Fuji II LC in DIS 39-25, Vitremer in DIS 41-23, and Photac-Fil in DIS 42-12. All except Photac-Fil were rated "Acceptable".

A synopsis of information for these products is provided in Attachment 2. Government cost is listed for

comparative purposes, but the reader should be wary of placing excessive importance on this factor when deciding which product to purchase. Because each product contains different accessories and a different amount of the restorative material, it is difficult to make meaningful cost comparisons. Other factors, therefore, should also be evaluated prior to purchasing one of these products. It is hoped that this synopsis will assist supply personnel and clinicians who are planning to purchase a hybrid resin/glass ionomer restorative material.

(Lt Col Charlton)

LABORATORY

42-20 Electrical Shock During Use of Steam Cleaners

Some concern has been received from the field regarding an electrical shock that is generated by steam cleaning devices used in the dental laboratory. These compact units provide a stream of steam pressure through a fixed spout or hand-held gun. The steamer is a common piece of equipment found in dental laboratories that is used for cleaning restorations throughout the fabrication process.

Under certain conditions, it is possible for the operator of this equipment to observe the discharge of electrical current generated by static electricity created by the steam. The discharge may be observed as sparks in the vapor stream in close proximity to the item being cleaned or the discharge can be felt as an electric shock as the static finds its ground through the operator.

Understandably, operators are startled and perplexed by this phenomenon. Equipment maintenance personnel are presented with the task of investigating the complaint. Without an understanding of how this device can generate a static charge and the intermittent nature of the condition, repairmen frequently find no reason for the problem. Typically, the device is tested for an electrical fault that never existed and is returned to service. When the operator again experiences the irritating electrical shock, the cycle of complaint and troubleshooting begins again.

The cause of static build-up is the high speed turbulence of steam vapor as it rushes through the exit hose and collides with the object in its path. The magnitude of the static charge varies greatly. The condition seems more prevalent when room humidity is low. Some operators are more prone to experience the shock than others under similar circumstances. Technique and body position as they relate to a grounded surface can determine whether the charge is gradually dissipated or accumulated to a higher voltage level before discharging as a harmless but alarming jolt.

The solution to this problem is a relatively simple one: the operator must be grounded to the equipment. Perhaps the easiest way to accomplish this is to construct a ground wire that is fastened to the chassis of the steam unit. At the other end of the ground wire, a spring clip should be fastened which can be secured to the operator's hand-held metal forceps that are used to grip the work that is being steamed. The connection will serve to ground the operator and gradually dissipate the static charge. Individual equipment manufacturers may offer static-shock protection through the use of an optional device which also accomplishes operator grounding via the hand grip.

(MSgt Thibadeau)

42-21 Steri-Prep (Project 94-11S)

Steri-Prep is a system for purging handpieces and sonic scalers after lubrication. The system is designed to minimize aerosol and injuries while running high speed handpieces and sonic scalers during purging. It consists of an air pressure regulator, coiled nylon hose, air gun, contaminant cylinder with filter, and adapters for air and handpiece lines. The unit uses a quick-attach, compressed air connection. Regulations require labeling the compressed air outlet as dental compressed air and a warning against using the air for medical air purposes.

Manufacturer:
D.E.C.K. Associates
Somers Professional Park
Route 100, P.O. Box 269
Somers, NY 10589
(800) 682-0262
(914) 277-3227
(914) 277-3268 FAX

Cost:
Retail: $399
Government: $299

ADVANTAGES:
+ Heavy and durable construction.
+ High-quality machining.
+ Available with adapters for most manufacturers' handpieces.
+ Allows purging of excess handpiece lubricant and retained water from high speed handpieces in a closed protective condition.
+ Permits removal of all pre-sterilization and post-sterilization handpiece lubrication and maintenance from the dental treatment room (DTR).
+ The connectors work well.
+ Offers a system for eliminating oil build-up in the dental unit exhaust lines.
+ All metal components are autoclavable for maintaining sterility of sterile handpieces.

DISADVANTAGES:
- Requires air line with universal adapter.
- Higher cost than some competing units.
- The steel cylinder is difficult to clean at the filter end.
- Performing all handpiece preparation outside of the DTR may be time-consuming, depending on the clinic layout.
- Awkward oil collection mechanism; must clean out steel cylinder.

- Screw-on handpiece connector; not pop-on as in other designs.
- Unlike other designs, it requires two-handed operation for connection on handpieces.
- Some angled slow speed motors like the Midwest Shorty will not fit into the cylinder although aerosol and projectile incidents are minimal with low speed motor attachments.

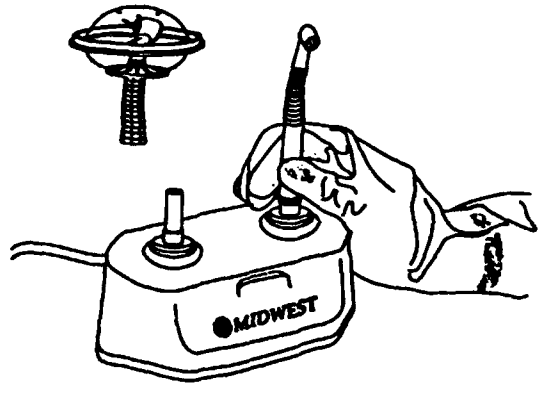
SUMMARY AND CONCLUSIONS:
The Steri-Prep is a well-designed, well-constructed system for performing high speed handpiece maintenance outside of the dental operatory. The application of this product would be for both pre- and post-sterilization purging of high speed handpieces. However, in most clinics, post-sterilization lubrication purging in a central preparation area may prove impractical and too time-consuming. **Steri-Prep performs its intended function and is rated Acceptable for use by the federal dental services.**

(Lt Col Shaffer)

42-22 Lifecycle Handpiece Air Station and Disposable Spray Guards

(Project 94-17S)

The Air Station is a unit designed for use with Midwest high and low speed handpieces. Intended to facilitate Midwest handpiece maintenance, it is used to purge excess lubricant from both high and low speed handpieces and distribute lubricant in low speed attachments. The Air Station is intended for use in the sterilization room and in conjunction with a plastic Spray Guard to limit aerosol emissions. The Lifecycle Air Station consists of a single unit that attaches to a compressed air source and an exhaust line. Note that regulations require labeling the compressed air outlet as dental compressed air and a warning against using the air for medical air purposes. The unit has two receiver fittings, one on each end of the base. One of the receiver fittings is for purging four-hole high speed handpieces and four-hole low speed handpiece motors. The other receiver fitting is for running low speed motor attachments after lubrication. The device is operated by depressing a prelubricated handpiece or low speed attachment onto the appropriate receiver fitting for the desired length of time. A Spray Guard is placed over the head of the high speed handpiece prior to purging and is discarded after purging.



Manufacturer:
Midwest Dental Products Corporation
901 West Oakton Street
Des Plaines, IL 60018-1884
(800) 800-2888
(708) 640-4800
(708) 640-6165 FAX

Cost:

Lifecycle Air Station	Spray Guards
Retail: $350	Retail: $19.99 for 100
Government: $178.50	Government: $11.99 for 100

ADVANTAGES:

+ Device works well and is easy to operate.
+ Provides a convenient method of distributing lubricant in low speed Midwest attachments.
+ Allows one-handed activation and operation.
+ Compact size.
+ Smooth and easy-to-clean plastic component housing.
+ Simple construction with good access to working parts.
+ Easy installation.
+ Skid-resistant base.
+ Spray Guard is disposable, inexpensive, and effective for limiting aerosols.
+ Components show good molding and casting techniques.
+ Offers a system for reducing oil build-up in the dental unit exhaust lines.

DISADVANTAGES:

- Made specifically for Midwest handpieces, although most standard four-hole handpieces can be run on the high speed fitting side of the unit.
- Because the device can not be sterilized, it is recommended only for presterilization purging.
- Cleaning of the bore holes in the handpiece receiver fittings must be done carefully and only with a noncorrosive or non-residue forming cleaner.
- The device tested did not force air through the chip air channel as advertised.
- Centrally aligning the handpiece head and bur in the Spray Guard is essential in order to prevent perforation of the plastic Spray Guard during purging.

SUMMARY AND CONCLUSIONS:

The Midwest Lifecycle Handpiece Air Station is a well-constructed system for performing high and low speed handpiece lubrication maintenance on Midwest dental handpieces. The Spray Guard which is used in conjunction with the Air Station is an effective and inexpensive method of limiting aerosol emissions during lubrication purging. This unit should be used only for presterilization lubrication since it is not sterilizable. The **Midwest Lifecycle Handpiece Air Station** and the **Spray Guard** perform their intended functions and are rated **Acceptable** for use by the federal dental services.

(Lt Col Shaffer)

42-23 Dispenser's Optical Service Safety Eyewear (Project 92-29)

The Occupational Safety and Health Administration (OSHA) Bloodborne Pathogens Standard requires employers to provide personal protective equipment, including safety eyewear, to all employees at risk of exposure to bloodborne pathogens. Currently, although examination and prescription services are available from USAF optometry services, frames must be purchased by dental services through local purchase sources. Dispenser's Optical Service provides complete safety prescription eyewear service and is available under Blanket Purchase Agreement (BPA) Contract #DLA 120-94-A-9056 (expires 1999).

Source:
Dispenser's Optical Service
P.O. Box 35000
Louisville KY 40232-5000
(800) 626-4545
(502) 491-3340
(502) 499-8445 FAX

Cost:
Cost per prescription (includes prescription lenses, carrying case, and standard frame; other frames available at additional cost):

Single Vision:	**$16.50**
Bifocal:	**$27.00**
Trifocal:	**$34.00**
Dual Seg:	**$63.00**
Progressive:	**$63.00**

The two frames selected for this evaluation were available at an additional cost of:
SC900 (Titmus Optical): $9.00 (male users)
PC205 (Titmus Optical): $14.00 (female users)

Dispenser's Optical Service has 70 different frames from both Titmus Optical and Liberty Optical available ranging from $9.00 to $33.50 under the BPA. Ten evaluators (6 male, 4 female) provided optical prescriptions which were filled by Dispenser's Optical Service. Each evaluator used the spectacles for up to 6 months. Eyewear was evaluated for characteristics including fit, comfort, field of view, extent of protection, scratch resistance, durability, and appearance.

ADVANTAGES:
+ Meets OSHA and American National Standards Institute (ANSI) standards for protective eyewear.
+ Lower cost than retail optical shops.
+ Wide variety of frame styles available in both male and female fashion frames.
+ Good compliance with prescriptions submitted for this evaluation.
+ Good overall protection from aerosols and spatter in both frame styles evaluated.
+ Prompt and convenient mail order service.
+ Good scratch resistance in both plastic and polycarbonate lenses.
+ Good durability.
+ Available on Blanket Purchase Agreement.

DISADVANTAGES
- Difficult to select a single frame style acceptable to all users.
- Some users found the frames selected for this evaluation to be too heavy (both SC900 and PC205).
- A minority of users found the fit, comfort, and perceived level of protection of the PC205 frame to be inadequate.
- Lack of adjustable nose pads in both frames.

SUMMARY AND CONCLUSIONS:
Overall, the Dispenser's Optical Service products submitted for evaluation were very well-received by clinical users. The most highly rated features were comfort, side shields, scratch resistance, and appearance. An individual evaluator, however, was dissatisfied overall. This emphasizes the inherent difficulty in selecting a single frame that will be acceptable to all users and the need for careful examination and fitting by an optometrist. The wide variety of styles available from this service makes it very likely that an acceptable frame style can be found. Although all spectacles were within the

parameters of the prescriptions provided by users, two individuals felt that the bifocal lines on their spectacles were too low. The Dispenser's Optical Service and Titmus Optical frame styles SC900 and PC205 are rated Acceptable for use by the federal dental services.

(Lt Col Mills)

42-24 OSHA and Chemical Vapor Sterilizers

A USAF dental clinic was recently cited by the Occupational Safety and Health Administration (OSHA) for inadequate monitoring of formaldehyde associated with the use of chemical vapor sterilizers (MDT Chemiclaves). The lack of specific training about the risks of formaldehyde was also cited. This highlights the need for good communication with the base bioenvironmental engineer and military public health section about the potential for exposure of clinic personnel to potentially hazardous chemicals.

OSHA requires monitoring at least initially and whenever there is any change in production, equipment, process, personnel, or control measures which may result in new or additional exposure to formaldehyde or whenever an employee reports signs or symptoms associated with exposure to formaldehyde. Your local bioenvironmental engineers may use one of several acceptable monitoring methods, including passive dosimeters or badges. One caution, however: the use of infra-red adsorption devices, such as the Miran 1B (Foxboro Co., Foxboro, MA), has resulted in exceptionally high false-positive readings due to interferences from the alcohol fraction in Vapo-Steril. The use of this type of detection device with Chemiclaves should be discouraged.

When operated properly, chemical vapor sterilizers can meet OSHA permissible exposure limits for formaldehyde. The use of the Chemipurge filter system and adequate ventilation are the only effective methods available to reduce the potential for occupational exposure. Chemipurge filters must be changed regularly (see DIS 41-08). The MDT Corporation states that used filters may be disposed of in routine trash.

(Lt Col Mills)

42-25 Obtaining the Best Results from Steam Sterilizers

Because many clinics are converting from chemical vapor sterilization to steam sterilization, DIS has received many inquiries about problems with wet packs and corrosion. Although corrosion of some instruments, particularly high-carbon steel items and burs, will be more pronounced with steam, the following tips can help you to obtain better results when using steam sterilizers.

1. DRY INSTRUMENTS BEFORE LOADING. Introducing water into sealed packages before sterilization increases the chances of water condensing on instruments following sterilization. Remember, steam is not particularly corrosive; it is the water that condenses on instruments that causes the damage. Corrosion can occur even in chemical vapor sterilizers when wet instruments are processed.

2. AVOID OVERLOADING. Overloading either individual packs or the sterilizer chamber can impede the effectiveness of the drying cycle. Overloading is also a major cause of sterilization failure. Packs should be loaded vertically as shown on the next page.

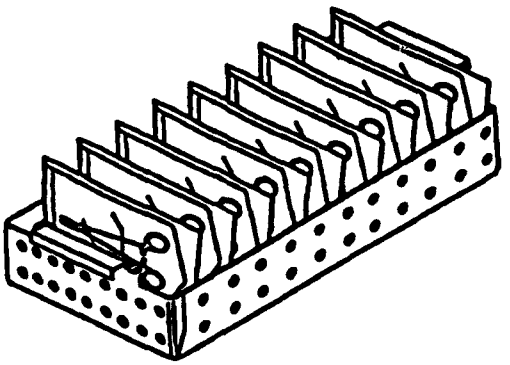


Figure reprinted from ANSI/AAMI American National Standard 42, Steam sterilization and sterility assurance in office-based, ambulatory-care medical and dental facilities, 1992, Association for the Advancement of Medical Instrumentation, Arlington, VA.

3. FOLLOW THE MANUFACTURER'S INSTRUCTIONS FOR THE DRYING CYCLE. Users of chemical vapor sterilizers often take instruments directly from the chamber following depressurization. This does not result in corrosion due to the rapid evaporation of alcohol-based chemical vapor solutions. Steam autoclaves require a drying cycle to prevent condensation of water vapor and resultant corrosion. This requires longer overall cycles for steam autoclaves. Be patient!

4. USE COMPATIBLE WRAPPING MATERIALS. Some brands of paper or paper-plastic combination wraps may not permit rapid evaporation of water vapor and can result in an increased likelihood of wet packs. If wet pack problems persist after all other remedies are tried, check with the autoclave manufacturer for recommendations on compatible wrapping products.

5. CONSIDER USE OF AN ANTI-CORROSIVE DIP. Even with the best technique, burs and carbon steel instruments may still corrode. Dipping these items into a solution of instrument milk or potassium nitrate before sterilization can be helpful. See your central sterilization people for sources for these solutions. Purchasing better quality instruments can also help alleviate problems.

If you are having problems with steam sterilizers that are refractory to the tips provided above, please let us know. Use the Field Assistance Request form on the last page of this newsletter to tell us about the problem. Identify the product, describe the problem, and tell us what you have tried in an effort to solve the problem. We will do our best to find a solution for you.

The following phone numbers can be used to obtain technical assistance from manufacturers of popular models of tabletop steam sterilizers.

AMSCO	(814) 452-3100
MDT Corporation	(800) 347-4638
Pelton and Crane	(800) 659-5922
Tuttnauer	(800) 624-5836

(Lt Col Mills)

Fabrication of a Sleep Apnea Prosthesis

Rodney C. Knudson, Colonel, USAF, DC
Chief, Maxillofacial Prosthetics
Wilford Hall Medical Center, Lackland AFB Texas

Obstructive Sleep Apnea (OSA) is a common, potentially life-threatening sleep disorder characterized by obstruction of the upper airway with persistent ventilatory effort. Obstruction may last 10 to 200 seconds and number several hundred episodes per night causing significant cardiopulmonary changes and oxygen desaturation. The most common complaints of an OSA patient are hypersomnolence, snoring, disturbed sleep and frequent arousals. Other symptoms include morning headaches, intellectual deterioration, anxiety, depression, nocturnal enuresis, and impotence. The patient can develop hypercarbia, hypoxemia, hypertension, polycythemia, heart failure, and cardiac arrhythmias.

The following instructions outline a technique for fabrication of a sleep apnea prosthesis for a dentate patient. The prosthesis is a noninvasive, reversible treatment that prevents or minimizes the collapse of the tongue against the pharyngeal walls by positioning the mandible in an opened vertical, protrusive position.

1. Obtain accurate casts using irreversible hydrocolloid impression material. A wax interocclusal record is made with the mandible in a protrusive end-to-end incisal relationship, opened 8 to 10 mm vertically.

2. On maxillary and mandibular casts, block out excessive hard and soft tissue undercuts with baseplate wax and duplicate casts. (Optional)

3. Mount master casts using the wax record in a semi-adjustable articulator. Duplicate casts can be cross mounted.

4. Using 2.0 mm clear stent material, vacuum form stents on maxillary and mandibular duplicate or master casts.

5. Using a separating disk or Robinson's hard bristle brush, cut stents to the desired shape leaving approximately 3 mm of stent material on the buccal and labial surfaces and 6 to 10 mm on the palatal or lingual of the soft tissues. The stent edges should be rounded and polished.

6. Stents are repositioned on mounted casts. Occlusal surfaces of stents are roughed; Visible Light Cured (VLC) bonding agent is applied and clear VLC sheet resin is used to build posterior rims. Divide intermaxillary space between maxillary and mandibular stents and leave 1 to 2 mm separation to facilitate the joining of the two segments.

7. Fit and adjust each stent. Clear VLC gel can be used to "spot" join the stents on the articulator. After it has been determined that the position is comfortable and effective, the segments can be permanently attached with clear VLC sheet resin.

SYNOPSIS OF VISIBLE LIGHT ACTIVATED GLASS IONOMER RESTORATIVE MATERIALS

PRODUCT	MANUFACTURER	SUGGESTED USES[a]	AVAILABLE IN CAPSULES	BOND STRENGTH[b] (MPa)	SHADES AVAILABLE	DENTIN PRETMT	GOV'T COST ($/KIT)[c]
Fuji II LC[d]	GC America 3737 West 127th Street Chicago, IL 60658 (800) 548-9272 (708) 597-0900 (708) 371-5103 FAX	class III and class V restorations; restoration of primary teeth; core build-up	yes	9.9 ± 2.1	A1,A2,A3, A3.5,A4,B2, B3,B4,C2, C4,D2	10% PAA for 20 seconds[e]	$92.80
Photac-Fil[f]	ESPE-Premier 1710 Romano Drive P.O. Box 111 Norristown, PA 19404 (800) 344-8235 (215) 277-3800 (800) 458-3987 FAX	class III and class V restorations; small class I restorations; restoration of primary teeth; core build-up	yes	0.1 ± 0.2	A1,A2,A3, A3.5,B2,B3, C4,DBO	25% PAA for 10 seconds[g]	$108.00
VariGlass VLC[h]	LD Caulk Division Lakeview and Clarke Avenues P.O. Box 359 Milford, DE 19963 (800) 532-2855 (302) 422-4511 (800) 788-4110 FAX	class III and class V restorations; liner and base; core build-up	yes	6.4 ± 1.3	A2,B1,C2, C3,DY,blue	primer for 30 seconds[i]	$63.65
Vitremer[j]	Dental Products Division 3M Health Care 3M Center Building 275-2SE-03 P.O. Box 33275 St. Paul, MN 55133 (800) 634-2249 (612) 733-1110 (800) 888-3132 FAX	class III and class V restorations; core build-up; class I and class II restorations in primary teeth	no	8.9 ± 2.2	A3,A4,C2, C4,pedo, blue	primer for 30 seconds[i]	$147.60

a. As suggested by the manufacturer
b. One-week shear bond strength to extracted human dentin after thermocycling (500 times between 5°C and 55°C). Mean ± standard deviation
c. Cost is for encapsulated form, if available; for more information on using cost as a factor in selecting a product, see item 42-19 in DIS 42
d. Reviewed in DIS 39-25; rated "Acceptable"
e. Fuji II LC is available with and without polyacrylic acid solution
f. Reviewed in DIS 42-12; rated "Unacceptable"
g. Must be purchased separately
h. Reviewed in DIS 39-24; rated "Acceptable"
i. Supplied in kit
j. Reviewed in DIS 41-23; rated "Acceptable"

ATTACHMENT 2

DEPARTMENT OF THE AIR FORCE
USAF DENTAL INVESTIGATION SERVICE
ARMSTRONG LABORATORY/AOCD
BROOKS AFB TX 78235-5117

FIELD ASSISTANCE REQUEST

NAME OF REQUESTOR _____

RETURN ADDRESS _____

PHONE: DSN _____ COMMERCIAL (___) _____ FAX _____

INFORMATION REQUESTED:

TYPE OF RESPONSE DESIRED: TELEPHONE____ LETTER____ MESSAGE____

FOR DIS USE ONLY

Project Officer _____

Date Received _____ Date Completed _____

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DENTAL INVESTIGATION SERVICE
ARMSTRONG LABORATORY/AOCD
2509 KENNEDY CIRCLE
BUILDING 125, ROOM 215
BROOKS AFB TX 78235-5117

DIS NEWSLETTER #42